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COMPLETE SPECIFICATION

Improvements in and relating to Drain Valves for Sinks or the like

We, GENERAL ELECTRIC COMPANY, a Corporation of the State of New York, United States of America, having its office at Schenectady 5, State of New York, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to drain valves for sinks or the like.

According to the present invention a drain valve in or for the drain opening of a sink or the like comprises a drain plug movably carried 15 by supporting means and adapted to be moved manually between two positions, namely a sealing position and an open position, said plug being gravity biased to one of said positions, and permanent magnet means comprising 20 relatively movable co-operating parts on the drain plug and the supporting means, respectively said parts being co-operative in the other of said positions to support the plug in said other position against gravity in a manually 25 releasable manner.

Two embodiments of the invention will now be described by way of example with reference to the accompanying drawing in which:

Fig. 1 is an elevation, partly in section of a 30 sink stopper of one embodiment of the invention,

Fig. 2 is an enlarged perspective view of the magnet used in Fig. 1, and

Fig. 3 is an elevation, partly in section, of 35 the second embodiment of the invention.

Referring to Fig. 1 which illustrates a preferred form of the invention, the numeral 1 designates a sink having a drain opening in which is mounted a flanged drain fitting 2 40 secured in sealing engagement by means of a nut 3 and a sealing gasket 4. Fitting 2 is provided with an upper annular seat or support 5 for supporting the drain valve assembly, and a lower annular valve seat 6. The drain valve 45 assembly comprises supporting means, namely

a strainer basket, generally designated by the numeral 7, having a perforated bottom wall 8 and a generally cylindrical perforated side wall 9. Formed around the upper edge of side wall 9 is a flange 10 adapted to rest on upper 50 annular seat 5 in drain fitting 2. Mounted in the centre of bottom wall 8 is a cylindrical member or sleeve 11 having a central bore in which is positioned a valve stem 12 mounted for reciprocating vertical movement therein. 55 Sleeve 11 is formed from a material having high magnetic permeability, such as iron. The upper end of stem 12 is preferably provided with a handle portion 13 to facilitate manual movement of the valve and removal of the 60 assembly from the drain opening. Fixedly secured to the lower end of valve stem 12 is a valve element 14 having a tapered annular surface adapted to engage valve seat 6 in fitting 2. As shown in the drawing the lower end of 65 stem 12 terminates in a portion of smaller diameter than the main portion thereof, and this smaller portion projects through a central opening in valve element 14. An enlargement 15 on the lower end of the stem formed by 70 peening, for example, secures the parts together.

In accordance with the invention valve element 14 is vertically movable between a raised open position and a depressed sealing position in engagement with valve seat 6. To 75 secure valve element 14 in its raised open position a permanent magnet 16 is fixedly secured on the drain plug and positioned so as to magnetically engage sleeve 11 when the plug is lifted manually to its upper position. 80 As shown in the drawing, permanent magnet 16 is generally cylindrical in shape with a pair of oppositely disposed pole pieces 16a and 16b. A central opening 16c is provided to accommodate stem 12 when it is assembled in fixed 85 relation with valve element 14.

From the foregoing it will be seen that the drain plug comprising valve element 14 and stem 12 may be supported in its raised open position as shown in Fig. 1 by magnetic 90

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attraction between permanent magnet 16 and sleeve 11 or it may be shifted to a depressed sealing position in which valve element 14 engages valve seat 6. Thus the drain valve illustrated in Fig. 1 may be moved to either a sealing position or an open position by simply raising or depressing handle 13, or the entire stopper assembly including the strainer basket 7 may be removed from the sink drain opening.

10 In the embodiment of the invention shown in Fig. 2, a drain valve suitable for use in a sink drain opening forming the inlet of a food waste disposer has been illustrated. This drain valve assembly is adapted to be supported in a drain opening fitting 17 secured in sealing engagement to a sink 18 by means of a nut 19 and a sealing washer 20. An annular seat or support 21 is formed in the fitting 17 at the lower end thereof, as shown. The waste disposer (not shown) may be secured to the sink in any suitable manner providing access to its grinding chamber through drain opening fitting 17.

This modified stopper assembly comprises supporting means, namely a circular supporting member 22 having a peripheral flange 23 adapted to rest in seat 21 in the drain opening. A central opening in supporting member 22 defined by an annular valve seat 24 which permits the flow of water into the drain opening is provided. Centrally supported within the opening in supporting member 22 is a cylindrical member or sleeve 25 composed of a material having high magnetic permeability, such as iron. The means for supporting sleeve 25 may consist of two or more spokes 26 arranged in radial fashion between the sleeve and the body of member 22 as shown. Mounted for reciprocating vertical movement in sleeve 25 is a valve stem 27 carrying at its upper end a valve element 28 having an annular inclined surface adapted to sealingly engage valve seat 24. A handle 29 formed on the upper surface of valve element 28 facilitates movement of the valve between open and closed positions and also the removal of the valve assembly from the drain opening.

Valve element 28 is supported in the raised open position shown in Fig. 3 by a permanent magnet 30 secured to the lower end of valve stem 27 and magnetically engagable with sleeve 25. Magnet 30 is similar to magnet 16, shown in Fig. 2, and its central opening accommodates the end of stem 27. Magnet 30 may be fixedly secured to the stem 27 between a shoulder and an enlarged portion 31 or by any other suitable means.

In this modification, if the stopper is used with a sink having a food waste disposer secured thereto, it may be completely removed from the opening by means of handle 29 to permit introduction of waste material into the opening and may then be replaced with the parts in the position shown in full lines during grinding or comminuting operations. In this

position drain valve 28 prevents the ejection of water and solid materials from the opening while permitting the free flow of water into the opening. To close the opening so that water may be accumulated in sink 18 it is merely necessary to press down on handle 29 sufficiently to disengage magnet 30 from sleeve 25 thus permitting valve 28 to seat by gravity in valve seat 24.

What we claim is:—

1. In or for the drain opening of a sink or the like, a drain valve comprising a drain plug movably carried by supporting means and adapted to be moved manually between two positions, namely a sealing position and an open position, said plug being gravity biased to one of said positions, and permanent magnet means comprising relatively movable co-operating parts on the drain plug and the supporting means, respectively said parts being co-operative in the other of said positions to support the plug in said other position against gravity in a manually releasable manner.

2. In or for the drain opening of a sink or the like, a drain valve as claimed in Claim 1, in which the supporting means rests or is adapted to rest within the drain opening.

3. In or for the drain opening of a sink or the like, a drain valve as claimed in Claim 1 or Claim 2, in which the permanent magnet means includes a permanent magnet secured to the drain plug or to the supporting member and co-operating with an element of high magnetic permeability on the supporting member or the drain plug.

4. In or for the drain opening of a sink or the like, a drain valve as claimed in any one of the preceding claims in which the valve is closed in the lower position of the drain plug and open in the upper position.

5. In or for the drain opening of a sink or the like, a drain valve as claimed in any one of the preceding claims, in which the supporting means includes a sleeve within which a stem secured to the plug is mounted for reciprocating movement.

6. In or for the drain opening of a sink or the like, a drain valve as claimed in any one of the preceding claims, in which the supporting means for the drain plug comprises a strainer basket.

7. In or for the drain opening of a sink or the like, a drain valve as claimed in Claim 5 and Claim 6, in which the sleeve is secured to a bottom wall of the strainer basket.

8. In or for the drain opening of a sink or the like, a drain valve as claimed in Claim 6 or Claim 7 in which an upper edge of a side wall of the strainer basket has a flange engaging or adapted to engage with an upper seat in the drain opening, the plug engaging in the sealing position with a second seat spaced vertically below said upper seat.

9. In or for the drain opening of a sink or the like, a drain valve as claimed in any one of

Claims 1 to 5 inclusive in which the supporting member comprises a peripheral flange portion resting or adapted to rest in a seat in the drain opening and surrounding a seating for the drain plug.

5 10. In or for the drain opening of a sink or the like, a drain valve as claimed in Claim 5, in which the sleeve is centrally supported within the flange portion by a plurality of spokes.

11. In or for the drain opening of a sink or 10 the like, a drain valve constructed, arranged and adapted to operate substantially as described with reference to Fig. 1 and Fig. 2 or Fig. 3 of the accompanying drawing.

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